REMARKS

Claims 1 and 15-19 have been amended. Claims 2, 3, 5, 7, 11 and 13 have been cancelled. Accordingly, claims 1, 4, 6, 8-10, 12, and 14-27 are presently pending, and favorable reconsideration thereof is respectfully requested. Claim 1 is the sole independent claim under consideration.

Support for the amendments to claim 1 may be found in the following paragraphs of the published specification (US 2008/0206127):

- "obtaining an aqueous feed solution" is supported, for example, in paragraphs 0008, 0012, and 0035;
- "comprising iron solubilized in one of nitric acid, sulfuric acid, and hydrochloric acid, the aqueous feed solution having a pH ranging from about 0.25 to about 2.5" is supported, for example, in paragraph 0039 and in the originally filed claim 13;
- "temperature from about 100°C to about 300°C" is supported, for example, in paragraph 0071 and in the originally filed claim 3;
- "a seeding ratio from about 20% to about 2000%, wherein the seeding ratio is a ratio of a weight of a seed solid to a weight of an expected unseeded precipitate product, and wherein the selected particle size of the ferric oxide precipitates is smaller than a particle size of the ferric oxide precipitates obtained with a seeding ratio of 0%" is supported, for example, in paragraphs 0015, 084, 0115, 0124 and in the originally filed claim 2;
- "pressures ranging from about 40 psig to about 1300 psig" is supported, for example, in paragraph 0072 and in the originally filed claim 11;
- "selected particle size from about 0.1 to about 10 microns" is supported, for example, in paragraph 0079 and in the originally filed claim 7.

Claims 15-19 have been amended in their dependency from claim 13 to claim 1.

Support for further amendment to claim 18 may be found in paragraph 0082.

35 U.S.C. § 102 (b)

The Examiner has rejected claims 1-3, 9-10, 20-27 under 35 U.S.C. § 102(b), as being anticipated by U.S. Patent No. 4,414,196 to Matsumoto et. al. (Matsumoto). As amended, all of claims 1-3, 9-10, 20-27 include the element of previously pending claim 13, which claim was not include in this rejection. Accordingly, this rejection may be withdrawn.

35 U.S.C. § 103

The Examiner has rejected claims 4, 7 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Matsumoto. As amended, all of claims 4, 7 and 8 include the element of previously pending claim 13, which claim was not include in this rejection. Accordingly, this rejection may be withdrawn.

The Examiner has rejected claims 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Matsumoto in view of Sumita. As amended, both claims 5 and 6 include the element of previously pending claim 13, which claim was not include in this rejection. Accordingly, this rejection may be withdrawn.

The Examiner has expressed the view that claims 11-14 are unpatentable over Matsumoto in view of US Patent No. 2,916,357 to Schaufelberger et al. (Schaufelberger).

Applicant respectfully submits that Matsumoto in view of Schaufelberger does not make obvious independent claim 1, as currently amended, and therefore it also does not make obvious dependent claims 11-14. Pursuant to the second of the *Graham* factual inquiries, as was submitted under the preceding headings, Applicant respectfully submits that Matsumoto fails to disclose or contemplate the following elements of claim

1 as currently amended:

- "obtaining an aqueous feed solution comprising iron solubilized in one of nitric acid, sulfuric acid, and hydrochloric acid, the aqueous feed solution having a pH ranging from about 0.25 to about 2.5"; and
- "a seeding ratio from about 20% to about 2000%, wherein the seeding ratio is a ratio of a weight of a seed solid to a weight of an expected unseeded precipitate product, and wherein the selected particle size of the ferric oxide precipitates is smaller than a particle size of the ferric oxide precipitates obtained with a seeding ratio of 0%".

With respect to Matsumoto, this cited reference discloses in column 1 at lines 59-68 and in column 2 at lines 1-9, a method of producing single crystalline, acicular alpha-Fe_2O_3 particles which comprises heating an aqueous suspension of amorphous ferric hydroxide at an elevated temperature from 100ºC to 250ºC at an alkaline pH in the presence of an effective amount of a growth regulating agent dissolved in the suspension and alpha-Fe_2O_3 seed crystals in amounts of 0.1-25 mole % in relation to the ferric hydroxide in the suspension (column 4 at lines 47-58). Matsumoto discloses that the growth regulating agent means an organic or an inorganic compound soluble in water, stable under the reaction conditions e.g., at least 100ºC in an alkaline medium, and capable of forming a complex with ferric iron, thereby to regulate or control the direction and speed of growth of alpha-Fe_2O_3 crystals produced (column 2 lines 36-42). Table 2 discloses the sizes of acicular alpha-Fe_2O_3 obtained. Matsumoto discloses that the aqueous suspension of ferric hydroxide having the agent and seeds is then subjected to a heat treatment at an elevated temperature at an alkaline pH, and that the pH of the suspension is adjusted at larger than 7, preferably 8-12.5 by the addition thereto of an alkali, e.g., sodium hydroxide, potassium hydroxide or ammonia (column 5 lines 6-16, Table 2). Matsumoto discloses in column 5 at lines 29-32 that the reaction is usually carried out in a closed vessel such an autoclave with stirring, and that there is no particular need to carry out the reaction under an increased pressure.

The Applicant therefore respectfully submits that Matsumoto fails to disclose or suggest "obtaining an aqueous feed solution comprising iron solubilized in one of nitric acid, sulfuric acid, and hydrochloric acid, the aqueous feed solution having a pH ranging from about 0.25 to about 2.5" as recited in the currently amended claim 1 because Matsumoto's process requires alkaline pH conditions. Matsumoto also fails to disclose or suggest "a seeding ratio from about 20% to about 2000%, wherein the seeding ratio is a ratio of a weight of a seed solid to a weight of an expected unseeded precipitate product, and wherein the selected particle size of the ferric oxide precipitates is smaller than a particle size of the ferric oxide precipitates obtained with a seeding ratio of 0%" as is recited in the amended claim 1. Although Matsumoto discloses a ratio, it is a ratio of seed crystals in relation to the ferric hydroxide in the suspension and not "a ratio of a weight of a seed solid to a weight of an expected unseeded precipitate product" as is recited by the Applicant in the amended claim 1. Thus, Matsumoto neither discloses nor suggests the claimed elements of acidic conditions or the seeding ratio as is recited in the amended claim 1. Therefore, Matsumoto fails to meet the above-noted requirements for a finding of anticipation of independent claim 1 as amended.

Turning now to Schaufelberger, this reference discloses in column 2 at lines 54-57 that the iron-bearing precipitate comprises high purity, hard, black ferric oxide crystals, quite uniform in particle size, usually averaging about ten to fifteen microns (also see column 6 lines 14-15). Schaufelberger discloses in column 2 at lines 66 to 72 that except that nitric acid replaces sulfuric, the present practice in many respects resembles acid-oxidation leaching as used on sulfide ores...somewhat lower but comparable temperatures of about 90°C-150°C may be used and the free oxygen containing gas is usually supplied at a partial pressure of oxygen of from 50 to 150 pounds per square inch gauge (psig) above the pressure autogenously developed. Schaufelberger further discloses in column 3 at lines 5-8 that sufficient oxygen should be available to insure all dissolved iron being in the ferric state and to minimize consumption of nitric acid for oxidation. Schaufelberger discloses the use of a closed pressure vessel (column 3 lines 60-61) and that temperatures above 250°C and pressure exceeding 500 psig should be avoided; excessive temperatures cause poor

product quality, while pressures up to 1000 psig or more may be used, excessive pressures do not aid in the reaction (column 3 lines 65-71).

Importantly, Schaufelberger is completely silent on seeding. Schaufelberger therefore does not disclose "a seeding ratio from about 20% to about 2000%, wherein the seeding ratio is a ratio of a weight of a seed solid to a weight of an expected unseeded precipitate product, and wherein the selected particle size of the ferric oxide precipitates is smaller than a particle size of the ferric oxide precipitates obtained with a seeding ratio of 0%". Furthermore, under the conditions disclosed in Schaufelberger, the particulates obtained are about 10 to 15 microns, and thus Schaufelberger fails to disclose a combination of elements (a) and (b) to obtain ferric oxide precipitates of a selected particle size from about 0.1 to about 10 microns as is recited in claim 1 as amended.

Accordingly, the combined teaching of the references fails to teach or suggest all of the elements of the claimed invention. Both Matsumoto and Schaufelberger fail to disclose or suggest "a seeding ratio from about 20% to about 2000%, wherein the seeding ratio is a ratio of a weight of a seed solid to a weight of an expected unseeded precipitate product, and wherein the selected particle size of the ferric oxide precipitates is smaller than a particle size of the ferric oxide precipitates obtained with a seeding ratio of 0%" as is recited in the amended claim 1.

Furthermore, Applicant respectfully submits that a person skilled in the art would not be motivated to combine Matsumoto and Schaufelberger to arrive at the process of claim 1 as amended because Matsumoto teaches that alkaline conditions are required. As reviewed above, Matsumoto emphasizes the importance of carrying the disclosed process under alkaline conditions. As such, one of ordinary skill in the art would not modify Matsumoto to carry out the process under acidic conditions. Thus, one of ordinary skill in the art would not combine the teachings of Matsumoto in view of Schaufleberger in the manner suggested by the Office.

Claims 11 and 13 have been cancelled, and thus objections to these claims have been overcome. Claims 12 and 14 are dependent upon independent claim 1 as currently amended. In view of the above arguments regarding non-obviousness of the amended independent claim 1, Applicant respectfully submits that dependent claims 12 and 14 are non-obvious due to their dependencies, as well as the additional subject matter that both of these claims recite. Accordingly, Applicant respectfully requests that this ground of objection be withdrawn.

The Examiner has expressed the view that dependent claims 15-19 are unpatentable over Matsumoto in view of the US Patent No. 6,159,435 to Nguyen et al. (Nguyen).

Applicant respectfully submits that Matsumoto in view of Nguyen does not make obvious independent claim 1 as currently amended, and therefore it also does not make obvious dependent claims 15-19.

With respect to the second of the *Graham* factual inquiries, as was submitted under the preceding headings, Applicant respectfully submits that Matsumoto fails to disclose or contemplate the following elements of claim 1 as currently amended:

- "obtaining an aqueous feed solution comprising iron solubilized in one of nitric acid, sulfuric acid, and hydrochloric acid, the aqueous feed solution having a pH ranging from about 0.25 to about 2.5"; and
- "a seeding ratio from about 20% to about 2000%, wherein the seeding ratio is a ratio of a weight of a seed solid to a weight of an expected unseeded precipitate product, and wherein the selected particle size of the ferric oxide precipitates is smaller than a particle size of the ferric oxide precipitates obtained with a seeding ratio of 0%".

Nguyen discloses a process for improved base metal and/or uranium leaching, and relates particularly, though not exclusively, to a process involving oxidizing ferrous ion (Fe^{2+}) to ferric ion (Fe^{3+}) and recirculation of the ferric ions for reuse in the leaching

process (column 1, lines 4-8, column 2 lines 64-66, column 3 lines 9-10). Nguyen discloses any suitable in-line mixer may be employed which allows the injection of oxygen or an oxygen-containing chemical reagent into the mixer to facilitate oxidation of Fe^{2+} ions to Fe^{3+} ions under the influence of a controlled pressure differential between the inlet and the outlet of the mixer (column 4 lines 13-18). Nguyen discloses that the rate of ferrous oxidation increases with decrease in acid concentration and the oxidation is most favorable at sulphuric concentrations below 1 N (column 4 lines 4-66). Nguyen further discloses in column 10 at lines 19-39 the although the residence time is comparable to that of a conventional pressure oxidation (autoclave) process, applicant's process achieves equivalent ferrous oxidation…without the application of pressure over the bulk volume of the ore/concentrate/tailings slurry or solution for the duration of the reaching process. Instead, the ore/concentrate/slurry or solution is preferably recirculated through a pressurized in-line mixer and discharged back to an unpressurised tank or reaction vessel…the present invention eliminates the need for an autoclave with its high capital cost. If desired autoclaves can still be used, but significantly, autoclave performance will be enhanced when used in embodiments of the present invention due to more efficient oxygen dissolution.

Applicant respectfully submits that Nguyen does not disclose a process for the production of ferric oxide precipitates having a selected particle size as is recited in claim 1 as currently amended. The Nguyen process is directed to producing ferric ions, and is silent on elements (a) and (b) as recited in claim 1. As such, the combined teaching of Matsumoto and Nguyen fails to teach or suggest all of the elements of the claimed invention.

Furthermore, Applicant respectfully submits that a person skilled in the art would not be motivated to combine Matsumoto and Nguyen to arrive at the process of claim 1 as amended because Matsumoto teaches that alkaline conditions are required. As reviewed above, Matsumoto emphasizes the importance of carrying the disclosed process under alkaline conditions. As such, one of ordinary skill in the art would not modify Matsumoto to carry out the process under acidic conditions. Thus, one of

ordinary skill in the art would not combine the teachings of Matsumoto in view of Nguyen in the manner suggested by the Office.

Claims 15-19, as currently amended, are dependent upon independent claim 1. In view of the above arguments regarding non-obviousness of amended independent claim 1, Applicant respectfully submits that the dependent claims 15-19 are non-obvious due to their dependencies, as well as the additional subject matter that each one of these claims recites. Accordingly, Applicant respectfully requests that this ground of objection be withdrawn.

CONCLUSION

In view of the above remarks, this application is considered to be in good and proper form for allowance and the Examiner is respectfully requested to pass this application to issuance.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-0815.

Respectfully submitted,
BOZICEVIC, FIELD & FRANCIS LLP

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By: /Bret E. Field, Reg. No. 37,620/
Bret E. Field
Registration No. 37,620

BOZICEVIC, FIELD & FRANCIS LLP
1900 University Avenue, Suite 200
East Palo Alto, CA 94303
Telephone: (650) 327-3400
Facsimile: (650) 327-3231
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